

What is claimed is:

1. A synchronization establishing and tracking circuit for a CDMA base station comprising:

a first spreading code generator generating a first spreading code sequence;

5 a first correlator calculating first correlation between said first spreading code sequence and a first quasi-coherent signal corresponding to a first received signal received by said CDMA base station;

10 a second spreading code generator generating a second spreading code sequence;

a second correlator calculating second correlation between said second spreading code sequence and a second quasi-coherent signal

15 corresponding to a second received signal received by said CDMA base station; and

a phase determining circuit determining a first phase of said first spreading code sequence based on an added quasi-coherent signal to which
20 said first and second quasi-coherent signals are added.

2. A synchronization establishing and tracking circuit according to claim 1, wherein said phase determining circuit includes:

a ranking portion determining a plurality

5 of target phases based on said added quasi-coherent signal; and

a phase setting circuit setting said first phase to a selected phase selected from among said target phases.

3. A synchronization establishing and tracking circuit according to claim 2, wherein said ranking portion determines an order of priority for said target phases based on said added quasi-coherent signal, and

wherein said phase setting circuit selects said selected phase in accordance with said order of priority.

4. A synchronization establishing and tracking circuit according to claim 2, wherein said ranking portion comprises:

a phase determining spreading code generator generating a phase determining spreading code sequence, wherein a phase of said phase determining spreading code sequence is sequentially shifted to one of candidate phases;

a phase determining correlator calculating correlation between said phase determining spreading code sequence and said added quasi-coherent signal to determine added signal

correlation values respectively corresponding to said candidate phases;

15 a ranking circuit selecting said target phases based on said correlation values.

5. A synchronization establishing and tracking circuit according to claim 1, further comprising:

 a maximum correlation phase determining circuit determining a despread phase based on
5 said first correlation;

 a desreading circuit desreading said first quasi-coherent signal to produce a despread signal using another spreading code sequence having said desreading phase; and

10 a synchronization detecting circuit detecting a synchronization of said first quasi-coherent signal with said another spreading code sequence to output a synchronization informing signal informing said first spreading code
15 generator of said synchronization, wherein said first spreading code generator fixes said first phase based on said synchronization informing signal such that said synchronization of said first quasi-coherent signal with said desreading
20 spreading code sequence is established.

6. A synchronization establishing and tracking

circuit according to claim 1, wherein said phase
determining circuit determining a second phase of
said second spreading code sequence based on said
5 added quasi-coherent signal.

7. A synchronization establishing and tracking
circuit according to claim 6, wherein said a
phase determining circuit includes:

a ranking portion which determines a
5 plurality of target phases based on said added
quasi-coherent signal; and

a phase setting circuit setting said first
and second phases to a selected phase selected
from among said target phases.

8. A synchronization establishing and tracking
circuit according to claim 7, wherein said
ranking portion determines an order of priority
for said plurality of target phases based on said
5 added quasi-coherent signal, and

wherein said phase setting circuit selects
said selected phase in accordance with said order
of priority.

9. A synchronization establishing and tracking
circuit according to claim 7, wherein said
ranking portion comprises:

a phase determining spreading code
5 generator generating a phase determining
spreading code sequence, wherein a phase of said
phase determining spreading code sequence is
sequentially shifted to one of candidate phases;

a phase determining correlator calculating
10 correlation between said phase determining
spreading code sequence and said added quasi-
coherent signal to determine added signal
correlation values respectively corresponding to
different phases of said candidate phases;

15 a ranking circuit selecting said target
phases based on said correlation values.

10. A synchronization establishing and tracking
circuit according to claim 1, further comprising:

a first maximum correlation phase
determining circuit determining a first
5 despread phase based on said first
correlation;

a first despread circuit despread
said first quasi-coherent signal to produce a
first despread signal using a third spreading
10 code sequence having said first despread
phase;

a second maximum correlation phase
determining circuit determining a second

despreading phase based on said second
15 correlation;

a second despreading circuit despreading
said second quasi-coherent signal to produce a
second despread signal using a fourth despreading
spreading code sequence having said second
20 despreading phase; and

a space diversity circuit identifying a
direction of a mobile station transmitting at
least one of said first and second received
signals, based on said first and second despread
25 signals.

11. A synchronization establishing and tracking
circuit for a CDMA base station comprising:

a spreading code generator generating a
spreading code sequence;

5 a correlator calculating correlation
between said spreading code sequence and a quasi-
coherent signal corresponding to a received
signal received by said CDMA base station;

a ranking circuit storing a plurality of
10 ranked phases; and

a phase setting circuit setting said phase
to a selected phase selected from among said
plurality of ranked phases.

12. A synchronization establishing and tracking circuit according to claim 11, further comprising:

an adding circuit adding said quasi-
5 coherent signal and at least one other quasi-coherent signal to produce an added quasi-coherent signal, wherein said other quasi-coherent signal corresponds to one or more other received signal received by said CDMA base
10 station, and

wherein said plurality of ranked phases are determined based on said added quasi-coherent signal.

13. A synchronization establishing and tracking method for a CDMA base station comprising:

generating a first spreading code sequence;
calculating first correlation between said
5 first spreading code sequence and a first quasi-coherent signal corresponding to a first received signal received by said CDMA base station;
generating a second spreading code
sequence;
10 calculating second correlation between said second spreading code sequence and a second quasi-coherent signal corresponding to a second received signal received by said CDMA base

station;

15 producing an added quasi-coherent signal on
which said first and second quasi-coherent
signals are added; and

 determining a first phase of said first
spreading code sequence based on said added
20 quasi-coherent signal.

14. A synchronization establishing and tracking
method according to claim 13, further comprising:

 determining a plurality of target phases
based on said added quasi-coherent signal;

5 selecting a selected phase from among said
plurality of target phases;

 setting said first phase to said selected
phase.

15. A synchronization establishing and tracking
method according to claim 14, wherein said
selecting includes:

 determining an order of priority for said
5 target phases based on said added quasi-coherent
signal; and

 selecting said selected phase based on said
order of priority.

16. A synchronization establishing and tracking

method according to claim 14, wherein said determining said plurality of target phases includes:

- 5 generating a phase determining spreading code sequence such that a phase of said phase determining spreading code sequence is sequentially shifted to one of candidate phases; calculating correlation between said phase
- 10 determining spreading code sequence and said added quasi-coherent signal to determine added signal correlation values respectively corresponding to said candidate phases; and selecting said target phases from among
- 15 said candidate phases based on said correlation values.

17. A synchronization establishing and tracking method according to claim 13, further comprising:

- determining a despreading phase based on said first correlation;
- 5 despreading said first quasi-coherent signal to produce a despread signal using another spreading code sequence having said despreading phase;
- detecting a synchronization of said first
- 10 quasi-coherent signal with said another spreading code sequence to output a synchronization

informing signal indicative of said
synchronization; and

fixing said first phase based on said
15 synchronization informing signal such that said
synchronization of said first quasi-coherent
signal with said another spreading code sequence
is established.

18. A synchronization establishing and tracking
method according to claim 13, further comprising:

determining a second phase of said second
spreading code sequence based on said added semi-
5 synchronous.

19. A synchronization establishing and tracking
method according to claim 18, further comprising:

determining a plurality of target phases
based on said added quasi-coherent signal; and
5 setting said first and second phases to a
selected phase selected from among said ranked
phases.

20. A synchronization establishing and tracking
method according to claim 13, further comprising:

determining a first despreading phase based
on said first correlation;
5 despreading said first quasi-coherent

signal to produce a first despread signal using a third spreading code sequence having said first despread phase;

determining a second despread phase
10 based on said second correlation;

despreading said second quasi-coherent signal to produce a second despread signal using a fourth spreading code sequence having said second despread phase; and

15 identifying a direction of a mobile station transmitting at least one of said first and second received signals, based on said first and second despread signals.

21. A synchronization establishing and tracking method for a CDMA base station comprising:

generating a spreading code sequence;
calculating correlation between said
5 spreading code sequence and a quasi-coherent signal corresponding to a first received signal received by said CDMA base station;

storing a plurality of ranked phases; and
setting said phase to a selected phase
10 selected from among said plurality of ranked phases.

22. A synchronization establishing and tracking

method according to claim 20, further comprising:

adding said quasi-coherent signal and at
least one other quasi-coherent signal to produce
5 an added quasi-coherent signal, wherein said
other quasi-coherent signal corresponds to one or
more other received signal received by the CDMA
station, and

wherein said plurality of ranked phases are
10 determined based on said added quasi-coherent
signal.